

CLAIMS

What is claimed is:

Subj B1
1. A nucleic acid mimic comprising a non-naturally occurring backbone structure to which are appended a plurality of heterocyclic bases,

at least one of said bases being substituted with at least one sterically bulky substituent at a position one, two or three atoms removed from the position of attachment of said base to the backbone.

Subj B2
10 2. The nucleic acid mimic according to claim 1 wherein said sterically bulky substituent is $-R'$, $-OR'$, $-SR'$, $-N(R')_2$, $-C(R')_3$, $-C(= X)(R')$, $-C(= X)(-Y-R')$ or $S(= O)_2(-Y-R')$ wherein:

Subj B2
X is O, S or NH;

15 Y is O, S or NH; and

wherein R' comprises at least 3 atoms and is H, C_1-C_{50} -alkyl, C_2-C_{50} -alkenyl, C_2-C_{50} -alkynyl, C_7-C_{50} -alkyl-aryl, C_6-C_{50} -aryl, $C_{10}-C_{50}$ -naphthyl, $C_{12}-C_{50}$ -biphenyl, C_7-C_{50} -aryl-alkyl, pyridyl, imidazolyl, pyrimidinyl, pyridazinyl, quinolyl, acridinyl, 20 pyrrolyl, furanyl, thieryl, isoxazolyl, oxazolyl, thiazolyl and biotinyl, wherein R' can be substituted one or more times by $-NO$, $-NO_2$, $-SO_3^-$, $-CN$, $-OH$, $-NH_2$, $-SH$, $-PO_3^{2-}$, $-COOH$, $-F$, $-Cl$, $-Br$ and $-I$.

25 3. The nucleic acid mimic according to claim 1 wherein said base is a naturally or non-naturally occurring pyrimidine base.

4. The nucleic acid mimic according to claim 3 wherein said sterically bulky substituent is bound to C-6, C-5 or N-4 of said naturally occurring pyrimidine base.

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5. The nucleic acid mimic according to claim 4 wherein said sterically bulky substituent is bound to N-4 of said naturally occurring pyrimidine base.

6. The nucleic acid mimic according to claim 5 wherein 5 said naturally occurring pyrimidine base is cytosine.

7. The nucleic acid mimic according to claim 5 wherein said sterically bulky substituent is (C=O)-R'' wherein R'' is C₁-C₂₀-alkyl or C₆-C₁₈-aryl.

8. The nucleic acid mimic according to claim 7 wherein 10 said sterically bulky substituent is (C=O)-C₆H₅.

9. A method for the determination of a nucleic acid comprising:

providing a nucleic acid mimic;

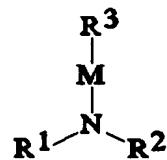
incubating said nucleic acid mimic and said nucleic 15 acid under conditions suitable for the formation of a duplex between said nucleic acid mimic and said nucleic acid; and

determining the occurrence of said duplex as a measure of the occurrence of said nucleic acid;

said nucleic acid mimic comprising a non-naturally 20 occurring backbone structure to which are appended a plurality of heterocyclic bases,

at least one of said bases being substituted with at least one sterically bulky substituent at a position one, two or three atoms removed from the position of attachment of said 25 base to the backbone.

10. A compound for the preparation of a nucleic acid mimic having the general formula:



wherein:

R^1 is $\text{C}_1\text{-C}_4$ -alkyl having at least one $-\text{COOP}^1$, $-\text{NHP}^1$, $-\text{OP}^1$ or $-\text{SP}^1$

5 P^1 is hydrogen or a protecting group;

R^2 is $\text{C}_1\text{-C}_4$ alkyl substituted by $-\text{COOP}^2$, $-\text{NHP}^2$, $-\text{OP}^2$ or $-\text{SP}^2$,
wherein P^2 is hydrogen or a protecting group;

M is a naturally or non-naturally occurring heterocyclic moiety
bound to N by a one to three carbon linker; and

10 R^3 is a sterically bulky substituent containing 3 or more non-
hydrogen atoms.

add
 B^3

add
 E^3/O
 F^3

add
 H'